PATENT SPECIFICATION 983,467

DRAWINGS ATTACHED.

983,467

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COMPLETE SPECIFICATION.

Lattice Girder.

I, JULIUS GEORG STEFAN KELLER, a German citizen, of 5a Paulastrasse, München-Solln, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to lattice girders.

The object of the present invention is to provide an improved lattice girder.

A lattice girder according to this invention is characterised in that each of the two flanges of the girder is formed of two flange plates spaced apart from each other, the web is formed of strip material of which portions, in the full width form of the strip, are bent transversely of the strip and are disposed between the said two flange plates of a girder flange pair thereof so that the full width of the web strip determines the spacing of the said two flange plates from each other, each said bent portion of the web being welded by the edges of the strip to the said two flange plates, and between the two girder flanges the web strip is bent to a channel transverse shape to provide a cross-section which is resistant to bending.

The invention enables lattice girders to be manufactured which have adequate buckling strength and which, more particularly, enable high section moduli to be provided with a small amount of material relatively to the bending axis which is usually referred to as the *y* axis.

A large moment of inertia or section modulus is provided relatively to the *y* axis by using a wide iron strip, involving a relatively small volume of iron for the web, and small-flange plates for the top and bottom flanges with a corresponding small amount of iron; the strip iron web retains the two flange plates forming each flange at the desired distance away from the *y* axis to the right and left theerof. Although the web is produced merely from flat strip material, the web is sufficiently strong since the strip material is formed into a bending-resistant cross-section between the flanges.

By way of comparison, numerical examples will be given hereinafter to show how the girder construction according to the invention provides the same strength for less weight than a conventional girder or, conversely, how the strength provided by a girder according to the invention is greater than that of a conventional girder of the same weight.

A girder according to the invention is illustrated by way of example in the accompanying drawings, wherein:—

Fig. 1 is a cross-sectional elevation of the girder; and

Fig. 2 is a side elevation of part of the girder.

The girder includes two flanges, one of which is formed of two flange plates F1 and F2 spaced apart from each other, the other flange being similarly formed of two flange plates F3 and F4, and a web S of strip material in the form of individual members of V-shape each providing two legs *s*1 and *s*2. The flange plates F1, F2, F3, F4 are welded, for example by resistance-welding, to the edges of the strip web S at the ends K1 and K3, and the apex K2 of the V-shaped web member. The web S strip is of iron and has a width *b* (Fig. 1) and a thickness *d* (Fig. 2). Between the flange plates F1 and F2, and also between the flange plates F3 and F4 the web S is bent transversely and has the full width *b* of the stock strip from which it is made, the said full width determining the spacing between the flange plates of each girder flange, but between the pair of

flange parts F1, F2 and the pair of flange parts F3, F4, that is in its inclined leg portions *s*1 and *s*2, it is bent to a channel transverse shape, having an opening *o* (Fig. 2), which will resist bending.

The web may be formed of one or more lengths of strip material each of which is in a continuous sinuous form.

A comparison between a lattice girder according to the invention and a girder in which, as is usually the case, the web is of round iron, assuming, for example, that strip or flat material of 60 mm × 4 mm is used as the stock material for the web S and is pressed to form a substantially V-shaped trough or channel section in that part of the web which is subjected to buckling, shows that a round iron of 21 mm diameter would have to be used to provide the equivalent buckling strength. The 60 mm × 4 mm strip iron weighs 1.88 kg. per metre run, but the 21 mm diameter round iron weighs 2.72 kg. per metre run, that is 45% more.

The example also shows that if the said round iron were to be used, the spacing between the flange plates would be 21 mm, compared with the 60 mm, that is about 3 times as much, in the case of the girder according to the invention, and this feature greatly increases the lateral rigidity of the girder without reducing any of its other strength features.

The grider according to the invention therefore has much better strength properties for a given weight compared with girders of conventional construction.

WHAT I CLAIM IS:—

1. Lattice girder, characterised in that each of the two flanges of the girder is formed of two flange plates spaced apart from each other, the web is formed of strip material of which portions, in the full width form of the strip, are bent transversely of the strip and are disposed between the said two flange plates of a girder flange pair thereof so that the full width of the web strip determines the spacing of the said two flange plates from each other, each said bent portion of the web being welded by the edges of the strip to the said two flange plates, and between the two girder flanges the web strip is bent to a channel transverse shape to provide a cross-section which is resistant to bending.

2. Lattice girder according to Claim 1, wherein the web is formed of a number of strips of material.

3. Lattice girder according to Claim 1, wherein the web is formed of one or more strips of material disposed in a continuous sinuous form between the two flanges.

4. Lattice girder substantially as described herein and shown in the accompanying drawings.

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983467 COMPLETE SPECIFICATION
1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

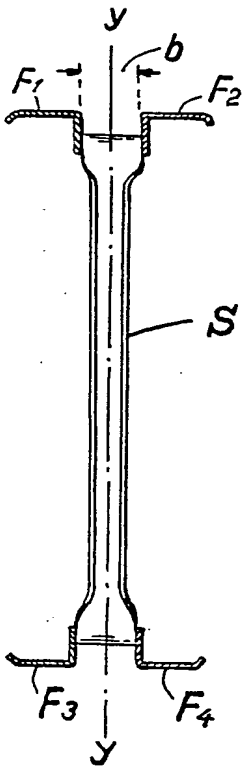

Fig. 1

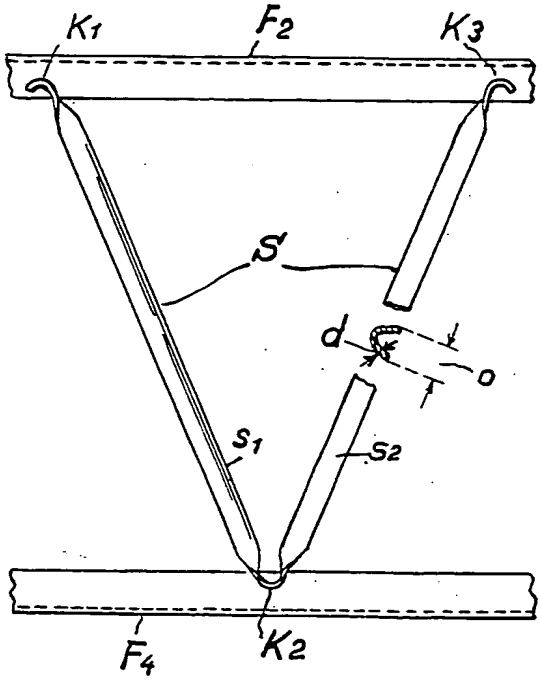

Fig. 2